

boplastic agent instead of rabbit brain. In the early series of cases with the dosage of Dicumarol controlled by the one-stage test using Russell viper venom, bleeding occurred in 40 percent of the cases.² Yet, that the Russell viper venom thromboplastin makes the one-stage prothrombin time sensitive to prothrombin depression can hardly be construed as introducing a *defect*. The misunderstanding lies in our interpretation of terms. *Error*, *limitation*, and *defect* are not synonymous.

The question of semantics is even more apropos in regard to the term *function* of platelets. Only two *functions* of platelets are experimentally and directly demonstrable: clot retraction and the generation of thromboplastin. When platelets are removed by high centrifugation, the resulting plasma when clotted shows neither retraction nor generation of thromboplastin by the test of Biggs and Douglas or by the prothrombin consumption time. But on adding known quantities of intact platelets to platelet-depleted plasma, both clot retraction and prothrombin consumption become proportional to the number of normal intact platelets.³ Platelet aggregation, viscous metamorphosis, platelet stickiness, and abnormal morphology are not *functions* but properties of platelets. One may postulate that when platelets have such abnormal properties, they do not function normally but, unfortunately, reliable direct methods to demonstrate the dysfunction are difficult to find. At best, the platelet plug concept of hemostasis is a *theory*.

It should be remembered that serious errors are made by interpreting a laboratory observation in the framework of an expected clinical finding. The reverse is far more trustworthy: correlating the clinical finding with the results of the laboratory tests. I have yet to find a thrombopathy characterized by clinical bleeding in which the prothrombin consumption test carried out by my standardized technique gave normal results.¹

ARMAND J. QUICK, M.D.
Hemostasis Research Laboratory
Marquette School of Medicine
Milwaukee

REFERENCES

1. Quick AJ: The determinant of the prothrombin time in normal human plasma. *Thromb Diath Haemorrh* 2:226, 1958
2. Prandoni A, Wright I: The anticoagulants: Heparin and the dicoumarin-3, 3' methylene-bis-(4-hydroxycoumarin). *Bull NY Acad Med* 18:433, 1942
3. Quick AJ, Shanberge JN, Stefanini M: The role of platelets in the coagulation of the blood. *Amer J Med Sci* 217:198, 1949
4. Quick AJ: *Bleeding Problems in Clinical Medicine*. Philadelphia, WB Saunders Co, 1970

The Distribution Of Population Growth

To the Editor: The following table was prepared from the 1970 World Population Sheet compiled by the Population Reference Bureau, Washington, D.C. Fractions have been converted to whole numbers.

Region or Country	Population Estimates Mid-1970 (millions)	Number of Years to Double Population	Population Projections to Mid-1985 (millions)
Latin America	283	21	435
Africa	344	27	530
India	555	27	808
China (Mainland)	760	39	965
U.S.A.	205	70	242
U.S.S.R.	243	70	287
France	51	88	58
Italy	54	88	60
West Germany	59	117	63
U.K.	56	140	62

This data confirms the previously known fact that the rate of population growth is considerably greater in the underdeveloped countries of Latin America, Africa and Asia than in the industrialized countries of Western Europe. While the populations and their rates of growth in the United States of America and the U.S.S.R. are comparable, it is sobering to consider that the population of China will be one thousand five hundred and twenty million by the year 2,009 A.D. The rapid population growth in countries which are relatively poor and least able to absorb the increase in people raises a number of questions. How will the additional people be fed? How can they be educated and what will they do in countries which are currently unable to educate and train their people? Finally, will some of these countries engage in wars of territorial expansion as the classic answer to population increase? A possible solution would be to direct some of the enormous amount of talent, thought, energy, and money at present used to limit the population growth of the United States and Europe towards educating the people of China, India, Africa, Latin America, etc.

W. LESLIE G. QUINLIVAN, M.D.
Department of Gynecology and Obstetrics
University of California, Irvine